



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,605	09/23/2003	Bernd Karl Appelt	4459-130	9744

7590

01/26/2006

LOWE HAUPTMAN GILMAN & BERNER, LLP
Suite 310
1700 Diagonal Road
Alexandria, VA 22314

EXAMINER

NADAV, ORI

ART UNIT	PAPER NUMBER
----------	--------------

2811

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,605	APPELT ET AL.	
	Examiner	Art Unit	
	Ori Nadav	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-16, 20-24 and 26-31 is/are pending in the application.
- 4a) Of the above claim(s) 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-15, 20-24 and 26-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to because reference number 30 in figure 1 depicts an encapsulant, but an encapsulant is not recited in the disclosure. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 23 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the disclosure for a device comprising a support supporting the window, as recited in independent claim 20, and having an opaque encapsulating material, as recited in claim 23, and described in the embodiment of figure 5.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claimed limitations of as recited in claim 27, are unclear as to which windows applicant refers.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-12, 14, 20-22, 24, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. (6,266,197) to in view of Boon et al. (2004/0041221A1).

Regarding claims 10 and 20, Glenn et al. teach in figure 2 and related text an optical semiconductor package comprising:

- a substrate 102 having opposite upper and lower surfaces;
- a chip 106 having an optical element and disposed on the upper surface;
- a plurality of bonding pads 104, 104A disposed on the upper surface;
- a plurality of bonding wires 114 electrically connecting the chip 106 to the bonding pads;
- a window 122 made of a transparent material (column 11, lines 5-10);
- a support 226 supporting the window for positioning the window corresponding to the optical element of the chip 106.

Note that a window made of a transparent material for allowing light to transmit through the window and interact with the optical element is a functional language and does not further limit or define the structure and is not given any patentable weight. Additionally, the device taught by Glenn et al. could have been used for the claimed purpose.

Art Unit: 2811

Glenn et al. do not teach an encapsulant formed on the substrate, encapsulating the chip and the bonding wires, for fixing the window and for hermetically fixing the support on the substrate.

Boon et al. teach in figure 4 and related text an encapsulant 32 formed on the substrate, encapsulating the chip 22, for fixing the window 6 and for hermetically fixing the support 2 on the substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an encapsulant formed on the substrate, encapsulating the chip and the bonding wires, for fixing the window and for hermetically fixing the support on the substrate in Glenn et al. in order to provide better protection to the chip.

Regarding claim 11 and 21, the claimed limitations of “encapsulant is formed by means of an overmolding process” are process limitations, which does not carry weight in claim drawn to structure, because distinct structure is not necessarily formed. A product by process claim directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See *In re Fessman*, 180 USPQ 324, 326 (CCPA 1974); *In re Marosi et al.*, 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product “gleaned” from the process steps, which must be determined in a “product by process” claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a

Art Unit: 2811

new method is not a patentable product, whether claimed in "product by process" claims or not.

Regarding claim 12, Glenn et al. teach a ledge (portion of 226) for securing the window in the encapsulant of prior art's device.

Regarding claims 14 and 24, Glenn et al. teach in figure 12 and related text the window is a lens 1104.

Regarding claim 22, Glenn et al. teach the window is hermetically disposed on the support 226.

Regarding claims 26 and 28, Glenn et al. teach the optical element comprises an optical sensor 106.

Claims 13 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. and Boon et al., as applied to claims 10 and 20 above, and further in view of Adams (4,732,042).

Glenn et al. and Boon et al. teach substantially the entire claimed structure, as applied to claims 10 and 20 above except teaching an encapsulant made of an opaque material.

Adams teaches an encapsulant 19 is made of an opaque material (column 3, line 40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an encapsulant made of an opaque material in the device of Glenn et al. and Boon et al., in order to provide better protection to light sensitive circuits of the device.

Claims 15 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. and Boon et al., as applied to claims 10 and 26 above, and further in view of Kaldenberg (5,897,338).

Glenn et al. and Boon et al. teach substantially the entire claimed structure, as applied to claims 10 and 26 above, except an adhesive for mounting the window on the optical element of the chip. Kaldenberg teaches in figure 4 an adhesive 28 for mounting the window 26 on the chip 12.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an adhesive for mounting the window on the optical element of the chip of the device of Glenn et al. and Boon et al. in order to improve the integrity of the device.

Regarding claim 27, the combined device shows the window has opposite upper and lower surfaces and a side surface connecting the upper and lower surfaces of the window;

a transparent adhesive layer attaching (indirectly) the lower surface of the window to an upper surface of the optical element of the chip; and

the encapsulant surrounds the window and directly contacts the side surface (the right surface side of the window of Glenn et al.) of the windows, while leaving the upper surface of the windows exposed from an upper surface of the encapsulant.

Claims 29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. in view of Okada et al. (4,838,089).

Regarding claim 29, Glenn et al. teach substantially the entire claimed structure, as applied to claim 20 above, including

a supporting wall 226 extending upwardly from the upper surface of the substrate 12;

a window made of transparent material and supported by the supporting wall at a location above the optical sensor for allowing light to transmit through the window and interact with the optical element

Glenn et al. do not teach an encapsulant formed on the upper surface of the substrate to surround the supporting wall.

Okada et al. teach in figure 3 and related text an encapsulant 36 formed on the upper surface of the substrate to surround supporting wall 28.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an encapsulant on the upper surface of the substrate to surround the supporting wall in Glenn et al.'s device in order to provide better protection to the device.

Art Unit: 2811

Regarding claim 31, the combined device shows the encapsulant, the supporting wall, the window and the substrate together define a hermetically sealed cavity in which the chip, the optical sensor and the wires are disposed.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. and Okada et al., as applied to claim 29 above, and further in view of Boon et al.

Glenn et al. and Okada et al. teach substantially the entire claimed structure, as applied to claim 29 above, including an encapsulant includes an outer portion covering an outer side surface of the supporting wall, but except a transparent encapsulant encapsulating the chip.

Boon et al. teach in figure 4 and related text an inner transparent portion 32 encapsulating the chip 22.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an inner portion encapsulating the chip and the wires and covering an inner side surface of the supporting wall, wherein the inner portion of the encapsulant is transparent, in the device of Glenn et al. and Okada et al., in order to provide better protection to the chip.

Response to Arguments

Applicant argues that Glenn et al. do not teach a window mounted on the sensor chip, because Glenn et al. teach a window mounted over the sensor chip.

The terms “on”, “over” and “above”, are synonymous when considering the claimed invention, because office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. See, e.g., *In re Zletz*, 893 F.2d 319, 321 - 22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) (“During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . .”)

Applicant asks how encapsulant 32 of Boom et al. hermetically fix support 226 of Glenn et al. on the substrate 102.

Forming encapsulant 32 of Boom et al. in the cavity of Glenn et al.’s device would hermetically seal the inner elements of the package of Glenn et al. between support 226 and substrate 102. The term “fix” does not provide any additional structural distinction between the claimed invention and prior art’s device.

Applicant argues that Glenn et al. do not teach that window 122 is mounted directly on chip 106, and a transparent adhesive layer attaching the lower surface of said window to an upper surface of said optical element, because encapsulant 24 interposed in between adhesive 28 and element 12.

The limitations of, a window mounted directly on a chip, and a transparent adhesive layer directly attaching the lower surface of said window to an upper surface of

Art Unit: 2811

said optical element, are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Note that transparent adhesive layer 28 can attach the lower surface of said window to an upper surface of said optical element, via encapsulant 24.

The rest of applicant's arguments with respect to claims 1-5, 10-15 and 20-31 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ori Nadav whose telephone number is 571-272-1660. The examiner can normally be reached between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 2811

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Ori Nadav', is positioned above the printed name.

O.N.
1/21/06

ORI NADAV
PRIMARY EXAMINER
TECHNOLOGY CENTER 2800